TABLE 2.—*Climatological data for Springfield, Mo., based on nineteen years' Weather Bureau records, unless otherwise stated.*
(Latitude 37° 12′ north, longitude 93° 18′ west. Altitude 1324 feet.)

Months.	Precipitation.									Snow.		Cloudiness.					Wind.				Average number of thunderstorms.
	Average.			Monthly and annual extremes (all records).		Greatest 24-hour fall.	Average number of rainy days.	Greatest number of consecutive days with—		Average.	Greatest 24-hour fall.	Average, 0—10.	Average number of days—			Total number of fogs.	Prevailing direction.	Average velocity.	Maximum velocity.		
	All records.	No. of years.	19 years, 1888–1906.	Max.	Min.			Rain.	Drought.				Clear, 0—3.	Partly cloudy, 4—7.	Cloudy, 8—10.				Velocity.	Direction.	
	Inches.		*Inches.*	*Inches.*	*Inches.*	*Ins.*				*Ins.*	*Ins.*	*Ins.*						*M.p.h*	*M.p.h.*		
January	2.50	24	2.59	6.47	0.34	4.64	9	5	19	5.3	10.0	5.1	11	9	11	31	se.	10.9	54	w.	1
February	2.44	25	2.42	5.22	0.81	1.86	10	8	9	4.7	7.5	5.4	10	8	10	13	se.	11.4	48	sw.	1
March	3.82	25	4.11	9.05	1.13	3.33	11	7	13	1.8	5.0	5.4	11	10	10	23	se.	12.4	60	nw.	4
April	4.00	25	3.69	8.32	1.10	1.86	11	7	12	0.3	1.6	4.7	11	11	8	7	se.	12.0	54	w.	6
May	5.61	26	5.73	11.75	2.48	3.70	12	7	16	0	0	4.6	11	13	7	12	s.	10.0	60	nw.	9
June	5.53	25	5.09	15.20	1.33	3.40	11	7	13	0	0	4.3	11	15	4	8	se.	8.2	63	nw.	10
July	4.77	26	4.77	13.12	0.50	4.81	10	8	16	0	0	4.1	12	15	4	3	s.	7.7	48	nw.	10
August	4.15	26	4.17	8.21	0.75	3.20	8	8	21	0	0	3.6	16	12	3	11	se.	7.4	48	n.	9
September	3.57	26	3.73	8.52	0.37	3.90	9	8	15	0	0	3.7	16	9	5	13	se.	10.1	48	nw.	4
October	2.75	26	2.79	9.75	0.40	2.74	7	6	19	0.1	1.0	3.5	18	8	5	20	se.	9.8	42	s.	2
November	2.71	26	2.59	5.68	0.22	2.58	8	7	22	0.7	3.0	4.9	12	8	10	13	se.	10.9	48	nw.	2
December	2.65	25	2.50	11.02	0.63	4.96	8	6	16	3.0	10.0	5.3	11	9	11	18	se.	10.9	44	se.	1
Year	44.50	.....	44.13	61.00	31.72	4.96	114	8	22	15.9	10.0	4.5	150	127	88	172	se.	10.1	63	nw.	59

TABLE 3.—*Dates of extreme temperatures for period January 1, 1888, to December 31, 1906.*

Year.	Minimum below 0°.	Maximum 95° or above.
1888	January 13–16	July 29–31; August 1, 2.
1889	None	None.
1890	February 28	June 30; July 7.
1891	None	None.
1892	January 19, 20; December 26, 27	July 22; August 7, 8.
1893	January 13, 15; February 7	July 28, 30; September 13–15.
1894	January 24	July 1; August 10, 12–15.
1895	February 2, 4, 5, 7, 8	None.
1896	None	July 27, 31; August 3–9, 14, 15, 21.
1897	January 26–28	July 7–9, 31; Aug. 1, 3, 26; Sept. 3.
1898	None	None.
1899	Jan. 27, 29–31; Feb. 8–13; Dec. 15	Aug. 3, 8, 9, 11, 12, 20, 23, 26; Sept. 4–7.
1900	February 17	August 21.
1901	December 14, 15, 17–20	June 20, 21, 25, 29; July 3, 4, 9–14, 16–24; August 2, 3, 25.
1902	Jan. 26, 27; Feb. 2, 4; Dec. 26	None.
1903	February 17; December 13, 26	None.
1904	January 25, 26, 29; December 27, 28	None.
1905	Jan. 14, 15, 24–26; Feb. 2, 3, 12–15	None.
1906	February 5	None.

TABLE 4.—*Dates of killing frosts at Springfield, Mo.*

Year.	Last in spring.			First in autumn.		
	Mar.	Apr.	May.	Sept.	Oct.	Nov.
1888	.....	.....	14	.....	3	.....
1889	.....	.....	3	.....	6	.....
1890	.....	1	.....	.....	14	.....
1891	.....	4	.....	.....	7	.....
1892	.....	15	.....	.....	9	.....
1893	.....	23	.....	.....	15	.....
1894	.....	.....	19	.....	8	.....
1895	.....	*21	.....	30	.....	.....
1896	.....	3	.....	.....	18	.....
1897	.....	17	.....	.....	29	.....
1898	.....	6	.....	.....	17	.....
1899	.....	9	.....	.....	29	.....
1900	.....	13	.....	.....	.....	1
1901	.....	18	.....	.....	14	.....
1902	.....	8	.....	.....	.....	26
1903	.....	3	.....	.....	.....	6
1904	.....	13	.....	.....	23	.....
1905	.....	16	.....	.....	21	.....
1906	.....	*30	.....	.....	10	.....

* Last freezing temperature.

TABLE 5.—*Precipitation, from Report of Missouri Rainfall.*

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Annual.
1877	.....	1.15	4.76	6.95	8.55	15.20	2.45	6.60	1.90	7.95	4.75	3.20	.....
1878	1.99	2.07	3.27	6.04	7.25	5.19	4.86	4.43	1.05	3.00	0.52	1.92	41.59
1879	1.82	0.66	1.40	2.64	2.59	2.85	1.18	1.50	0.68	0.97	4.62	4.15	25.06
1880	0.87	2.97	2.58	5.10	4.20	4.05	4.50	.....	.....	2.00	3.05	0.80	.....
1882	2.65	7.29	3.19	3.71	8.07	2.70	4.98	2.14	4.48	7.62	6.30	2.30	55.43
1883	1.05	5.65	1.68	3.11	7.30	.....	.....	.....	.....	.....	.....	.....	.....
1884	.....	.....	.....	.....	5.48	2.67	9.22	3.17	3.80	1.73	3.03	7.62	.....
1885	2.80	1.05	2.10	5.01	3.29	5.15	9.14	3.73	6.15	1.75	2.05	1.50	43.72
1886	1.55	3.43	1.50	2.90	9.30	.....	1.75	2.60	3.40	0.40	.....	0.75	.....
1887	2.60	4.10	2.50	2.80	4.60	6.65	2.63	3.29	2.43	2.08	3.27	2.39	39.34

areas of high pressure that develop over the plains of the far Southwest and move toward the middle Mississippi Valley. Rising temperature, increasing southerly winds, and rain, may be expected from a barometric minimum from this quarter, followed by cooler weather, northerly winds, and clearing skies, as the high pressure area becomes the controlling factor.

Thunderstorms are of frequent occurrence during the spring and summer months, and are one of the most prolific sources of rainfall during this season. They are, for the most part, coincident with the approach of low barometric areas from some western quarter, and are rarely of local origin.

The prevailing weather during the crop season, i. e., March to September, inclusive, is eminently favorable to agricultural pursuits. During this period the temperature for the past nineteen years has averaged 65.5°, and the precipitation, 31.29 inches. These figures, reinforced by the fact that ample sunshine occurs, exhibit an ideal condition for the germination, growth, and maturity of all crops.

HYTHERS AND THE COMPARISON OF CLIMATES.[1]

By Mr. W. F. TYLER, F. R. Met. Soc., Coast Inspector, in charge of the meteorological affairs of the service of the Imperial Maritime Customs. Dated Shanghai, China, January 4, 1905.

I have read the pamphlet "Some Climatic Features of the Arid Regions" with great interest and also the papers by Harrington and Pague to which you referred me.

By far the most instructive article is that in the MONTHLY WEATHER REVIEW for August, 1898, on the "comfort curve" ("Sensible temperatures or the curve of comfort", August, 1898, p. 362). In that article the problem that is indicated is: "What function is ideal weather of temperature, humidity, and wind force?"

This problem, dealing as it does with a three-variable function, is necessarily very difficult, the more so that wind force does not appear to be an elemental factor in the total subjective effect of climate as are temperature and humidity.

[1] The editor regrets that this interesting letter was mislaid and has so long remained unpublished. See the Monthly Weather Review, May, 1904, Vol. XXXII, p. 217. Readers interested in the subject will perhaps make use of the following bibliography:

Osborne, J. W. On a new meteorological instrument. Proc. Am. Asso. Adv. Sci., Detroit meeting, 1875.

Pague, B. S. Sensible temperatures, or the effect of heat on the body in California. July, 1895. Reprint in Am. Met'l. Jour., Oct., 1895, p. 196–198.

Harrington, Mark W. Sensible temperatures. Read before the Am. Climatological Asso., May, 1894. (Abstract in Am. Met'l. Jour., July, 1895, p. 93–95.) Intern. Med. Mag., Aug., 1894.

Ward, R. DeC. Sensible temperatures. Bull. Am. Geog. Soc., March, 1904.

Phillips, W. F. R. Sensible temperature. Trans. Am. Climatological Asso., 1896, Vol. 12, p. 16–25.—*C. A.*

In the problem which I have indicated, the matter of individual tastes in weather is to a very considerable extent eliminated. A standard of ideality of weather is not the object sought. The problem which I propose is: "In climatic conditions causing the same degree of sensation, do the correlated temperatures and humidities vary according to some law?"

In attacking this problem I premise the practicability of dividing a sensation between two roughly identifiable limits into a number of "equal" parts. This I know may be a controversial matter.

Now climatic conditions have to be submitted to indoors as well as out of doors, and taking indoor climate, i. e., out of an air movement of variable velocity, the problem is greatly simplified. The air movement caused by a punka does not affect the function, (over a certain range of hyther); it merely results in a constant. An electric fan, either movable or with variable speeds, is unsuited to an observer.

The comfort curve is, of course, included in my investigation—it is the zero hyther curve. The establishment of a mere personal comfort curve, while very interesting in its way, would be of but little use in a scheme for comparing climates, which is the main object of my investigation.

I note with interest that Mr. Osborne attempted in 1872–1875 to establish a scale of sensible temperatures from a record of individual sensations and that a year's observations from over twenty observers resulted in nothing satisfactory.

In my investigation I have very carefully selected my observers from those whose occupation and environment were such as to eliminate as far as possible the difficulty caused by a variation of these.

I consider the term "sensible temperature" to be rather misleading, temperature being only one factor in the subjective effect. It was for this reason that I felt the absolute necessity for a new term, and I coined the word *hyther* from *hydro* and *thermos*.

During the past summer I have obtained some 2000 records of hyther in Shanghai and Canton, which I will attempt to synthesize when I get the opportunity.

There is one line of investigation which I would suggest be taken up by some one—i. e., the limiting conditions of temperature and humidity in which animal life can exist. A very rough approximation to this would be of great use to my scheme.

Supposing I am able to satisfactorily establish hyther curves from 0 to 6 and also a death line far along the scale, it would probably be possible to interpolate isohyther curves between.

AN OLD INDIAN RULE FOR PREDICTING WINTER TEMPERATURES.

In a pamphlet of 1789, "On the Climate of Pennsylvania", by Dr. Benjamin Rush, reprinted in The American Museum, Volumes VI and VII, the author says:

"The Indians have long ago taught the inhabitants of Pennsylvania that the degrees of cold during the winter are in proportion to the quantity of rain which falls during the autumn".

Presumably this sentence refers to the rain that fell during the autumn immediately preceding. As the statement may refer to the eastern part of Pennsylvania, rather than to the western portion, we submit the accompanying Table 1, showing the rainfall during the months of September, October, and November, and the temperatures during the following months of December, January, and February, as recorded at the Pennsylvania Hospital in Philadelphia, from 1825 to 1888.

Out of the twenty-two years when the autumn rainfall was one inch or more above the mean, ten cases gave the mean temperature of the following winter below, and twelve cases above, the mean of the entire period of sixty-four years.

Out of thirty-one years when the autumn precipitation was one inch or more below the mean, seventeen cases gave the mean temperature of the following winter below and fourteen cases above the mean for the whole period.

TABLE 1.—*Autumn precipitation and succeeding winter temperature at Pennsylvania Hospital, Philadelphia, Pa.*

(Data from Lorin Blodget's "Climatology of Pennsylvania".)

Year.	Precipitation. Autumn.			Temperature. Winter.			Total precipitation. Autumn.	Mean temperature. Winter.
	Sept.	Oct.	Nov.	Dec.	Jan.*	Feb.*		
	Ins.	*Ins.*	*Ins.*	°*F.*	°*F.*	°*F.*	*Inches.*	°*F.*
1825	2.61	1.25	1.36	34.0	34.0	35.5	5.22	34.5
1826	2.00	5.83	1.85	34.0	27.0	35.0	9.68	32.0
1827	0.79	5.91	4.76	35.0	37.0	41.5	11.46	37.8
1828	4.62	1.39	6.71	39.0	30.0	25.0	12.72	31.3
1829	2.01	2.30	3.97	42.0	30.0	31.5	8.28	34.5
1830	2.93	4.31	5.35	37.0	27.0	28.0	12.59	30.7
1831	5.33	4.51	1.88	25.0	33.0	36.0	11.72	31.3
1832	1.40	3.41	2.50	38.0	36.0	35.5	7.31	36.5
1833	3.82	10.05	2.48	37.0	29.5	42.0	16.35	36.2
1834	3.57	3.29	3.01	37.0	32.0	28.0	9.87	32.3
1835	2.63	1.22	3.19	31.0	28.0	24.0	7.04	27.7
1836	1.82	3.59	3.34	29.0	26.5	30.9	8.75	28.8
1837	2.28	0.66	3.23	33.0	36.8	23.6	6.17	31.1
1838	9.52	4.90	3.35	28.4	29.5	33.3	17.77	30.4
1839	2.92	2.83	3.10	34.8	29.4	39.4	8.85	34.5
1840	2.50	5.73	2.49	30.7	33.3	30.4	10.72	31.5
1841	1.90	3.20	4.32	34.5	35.1	38.3	9.42	36.0
1842	1.27	1.71	3.49	32.6	38.0	28.5	6.47	33.0
1843	4.86	3.22	4.15	33.9	27.0	32.0	12.23	31.0
1844	4.03	5.03	2.95	34.2	37.0	34.5	12.01	35.2
1845	2.16	2.53	2.50	28.3	33.3	29.5	7.19	30.4
1846	0.25	2.45	7.97	35.8	32.3	33.2	10.67	33.8
1847	8.07	3.00	2.84	39.5	36.7	23.6	13.91	33.3
1848	1.81	3.75	2.34	43.2	29.0	27.5	7.90	33.2
1849	1.41	5.60	2.60	34.4	35.8	37.1	9.61	35.8
1850	7.73	1.09	3.32	36.5	35.2	39.8	12.14	37.2
1851	1.13	3.03	3.35	30.0	27.5	34.1	7.51	30.5
1852	1.29	2.27	6.06	41.9	33.1	37.3	9.62	37.4
1853	4.46	3.47	2.32	35.0	32.2	34.5	10.25	33.9
1854	3.80	1.55	2.83	31.0	35.7	27.6	8.18	31.4
1855	4.00	4.11	2.04	36.7	24.1	26.1	10.15	29.0
1856	4.01	1.30	2.07	32.7	22.4	41.0	7.38	32.0
1857	1.11	2.69	1.45	40.3	39.7	29.4	5.25	36.5
1858	1.49	1.84	5.61	37.4	34.0	36.9	8.94	36.1
1859	7.68	3.13	3.82	32.8	33.1	32.7	14.63	32.9
1860	2.85	4.52	6.13	32.2	30.7	39.2	13.50	34.0
1861	4.40	3.80	4.87	37.0	32.5	32.7	13.07	34.1
1862	3.98	4.77	4.79	33.1	38.2	36.0	13.54	35.8
1863	0.88	2.46	2.70	35.4	33.3	36.0	6.04	34.9
1864	7.16	1.82	3.93	36.8	26.8	32.6	12.91	32.1
1865	7.96	3.05	3.96	37.4	29.3	34.1	14.97	33.6
1866	8.71	4.15	1.76	33.6	25.9	40.2	14.62	33.2
1867	1.72	4.32	2.94	31.8	30.1	26.6	8.98	29.5
1868	8.91	1.74	5.28	32.2	37.0	37.7	15.93	35.6
1869	3.25	6.32	3.73	37.3	41.1	34.9	13.30	37.8
1870	1.71	8.89	2.10	35.5	31.3	33.9	7.70	33.6
1871	1.77	4.86	4.29	30.8	29.7	32.9	10.92	31.1
1872	3.82	5.36	3.38	28.2	29.7	30.6	12.56	29.5
1873	4.05	5.89	4.99	38.4	37.1	33.7	14.93	36.4
1874	3.99	1.65	2.23	36.1	25.7	26.2	7.87	29.3
1875	3.04	1.83	5.54	35.1	38.0	34.3	10.41	35.8
1876	7.78	1.21	9.03	26.9	28.6	37.4	18.02	31.0
1877	3.88	6.96	6.51	40.7	34.4	37.8	17.35	37.6
1878	1.42	2.39	2.89	33.4	28.9	30.2	6.70	30.8
1879	1.30	0.45	1.62	37.8	39.1	39.0	3.37	38.6
1880	1.68	2.09	1.96	28.9	27.0	31.0	5.73	28.7
1881	1.24	3.72	3.14	41.1	31.6	36.9	8.10	36.5
1882	13.90	1.29	1.64	33.1	28.4	34.1	16.83	31.9
1883	4.43	4.11	1.56	33.8	26.9	38.2	10.10	33.0
1884	0.27	1.90	4.01	34.6	31.0	24.3	6.18	30.0
1885	1.08	4.85	4.30	35.7	28.0	29.7	10.23	31.1
1886	1.46	2.52	4.96	29.5	30.2	35.0	8.94	31.6
1887	5.34	2.07	1.60	35.4	26.2	32.9	9.01	31.5
1888	6.50	4.01	3.99	35.6	.....	.....	14.50	.....
Means	3.61	3.83	3.56	34.7	31.6	33.2	11.00	33.2

*Of the following year.

For the ten special years of unusually heavy autumn rainfall, the character of the following winter, as compared with the mean of sixty-four years, was as follows:

1833.....Warm.	1868.....Warm.
1838.....Cool.	1873.....Warm.
1859.....Cool.	1876.....Cool.
1865.....Warm.	1877.....Warm.
1866.....Cool.	1882.....Cool.

For the nine special years of unusually light autumn rainfall, the character of the following winter, as compared with the mean of sixty-four years, was as follows:

1825.....Warm.	1878.....Cool.
1837.....Cool.	1879.....Warm.
1842.....Cool.	1880.....Cool.
1857.....Warm.	1884.....Cool.
1863.....Warm.	